

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-161656

(43)Date of publication of application : 18.06.1999

(51)Int.Cl.

G06F 17/30
G06F 12/00
G06F 12/00
G06F 12/00

(21)Application number : 09-326349

(71)Applicant : ASAHI CHEM IND CO LTD

(22)Date of filing : 27.11.1997

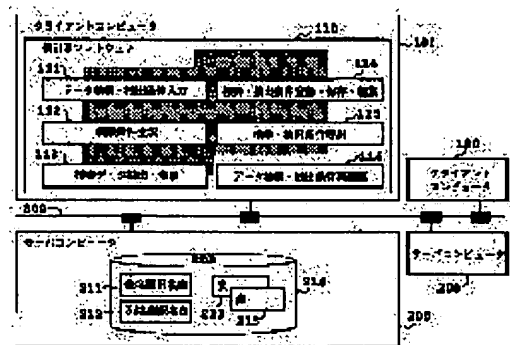
(72)Inventor : SASAKI KAZUNOBU
KUROKAWA NOBUYUKI
OGAWARA AKASHI

(54) DATA BASE RETRIEVAL AND EXTRACTION SYSTEM AND RECORDING MEDIUM IN WHICH CONTROL PROGRAM FOR DATA BASE RETRIEVAL AND EXTRACTION IS RECORDED

(57)Abstract:

PROBLEM TO BE SOLVED: To enable repetitive calling from a menu by enabling a user who does not understand the syntax of SQL statements for relational data base inquiry to input data retrieval and extraction conditions and relating data retrieval and extraction conditions that the user inputs to the menu of spread sheet software.

SOLUTION: This system has a process 111 for inputting data retrieval and extraction conditions, a retrieval condition generating process 112 for generating SQL statements from the data retrieval and extraction conditions, a process 113 for sending the SQL statements to a server 200 and displaying data extracted from a data base 210 on the server on the spread sheet software 110, a process 114 for registering and saving the data retrieval and extraction conditions in relation to the menu of the spread sheet software 110, a process 115 for enabling the retrieval and extraction conditions related to the menu to be called repeatedly, and a process 116 for making it possible to repeatedly edit the retrieval and extraction conditions.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the
examiner's decision of rejection or application
converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of
rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

Detailed Description of the Invention

[0001]

[The technical field to which invention belongs] This invention relates to the database system of a client-server type (it is also called a server client method), especially, searches and extracts data from the relational database on a server, and relates to the record medium which recorded database retrieval / extract system and the control program for data base retrieval / extract which display data on the spreadsheet software on a client machine.

[0002]

[Description of the Prior Art] In recent years, utilization of the client-server type database system which accesses the table data of the relational database (RDB) on a server, and uses it from the personal computer (PC) of a client is performed widely.

[0003] Further, by spreadsheet software, that both the spreadsheet software on the data structure of Above RDB and PC is expressed with a 2-dimensional tabular format, and since processing of data and graphing are easy, spreadsheet software is used as a front end program on a client. These programs have the graphic user interface (GUI), and a user can set up easily the item and retrieval conditions which take out data according to the markup force from the selection actuation and the keyboard from a train name are shown in the identifier of the table in RDB shown the list table, or a table. Furthermore, setting out of this data ejection can be developed and recorded on the macro which spreadsheet software has, and the program which can be saved as a file of spreadsheet software is offered (for example, "DB server access technique from Windows personal computer" Nikkei Business Publications April 10, 1995 publication).

[0004]

[Problem(s) to be Solved by the Invention] however, although these conventional programs made the data ejection procedure from RDB the macro and generation of a subroutine was carried out, the technical problem which should be solved that it was as that it is necessary to correct the macro as which a know how is required occurred, that there is no injury with relation of the sheet which takes out data, and the sheet with which the macro was written, and he needs to relate whenever a user generates a macro.

[0005] Furthermore, when it saved as a file or the saved file was used, the user needed to memorize the directory and the file name. For example, although the directory where the file was saved is looked for and the target file is looked for from the directory in case the target file is looked for Even if it exists innumerable and, as for a directory, a directory is known, many various files are in the same directory. For this reason, usually, in the former. The technical problem which should be solved that there were many portions for which it depends on storage of a user in respect of file management, and the burden given to a user was large occurred.

[0006] Moreover, in the chemical industry, treat time series data in many cases, and the conditions about a period are indispensable as retrieval conditions in this case. Although

a connection condition when the train which takes out data from two or more tables is specified is performed in a train with the data of time amount (date) in many cases For example, many of programs which are described at "DB server access technique from Windows personal computer" Nikkei Business Publications publication of the above-mentioned reference It is the input procedure which was conscious of the syntax of an SQL (Structured Query Language) sentence. The technical problem which should be solved that the input of the complicated retrieval conditions which need special information for a user without the structure of RDB or the information of an SQL sentence, or a connection condition was surely required by any cases occurred.

[0007] It is made in order that this invention may solve the technical problem of such conventional technology. The user who seldom understands the syntax of the SQL sentence for a relation data base inquiry also enables the input of data retrieval and an extraction condition. Moreover, the data retrieval and the extraction condition which the user inputted are related with the menu of spreadsheet software. It aims at offering the record medium which recorded data base retrieval / extract system and the control program for data base retrieval / extract which make the repeat call from a menu possible.

[0008] Furthermore, in order that the object of this invention may mitigate the time and effort in file management in detail, At the same time it subroutines the procedure of the data retrieval and the extract from RDB which the user inputted It saves without making it conscious of a directory or file management, the menu of the file and spreadsheet software is associated, and it can be made to carry out repeat retrieval easily from a menu, Moreover, in using the retrieval conditions and two or more tables which specify a period at the time of a time series data access, it is in offering the record medium which recorded data base retrieval / extract system and the control program for data base retrieval / extract which made it possible to generate a connection condition automatically.

[0009]

[Means for Solving the Problem] In order to attain the above-mentioned object, invention of claim 1 In data base retrieval / extract system which inspects and extracts data from a relational database on a server, and displays data on spreadsheet software on a client machine Data retrieval and an extraction condition input means to input data retrieval and an extraction condition for searching and extracting data from a data base on a server, A retrieval condition generation means to generate an SQL sentence from said data retrieval and extraction condition inputted from this data retrieval and extraction condition input means, Data is extracted from a data base by which transmitted said SQL sentence generated with this retrieval condition generation means to a server by which the assignment input was carried out with said data retrieval and extraction condition input means, and the assignment input was carried out with said data retrieval and extraction condition input means. Retrieval data extraction and a display means to change and display extracted this data on data format of said spreadsheet software according to a display condition by which the assignment input was carried out with said data retrieval and extraction condition input means, Sufficient retrieval / extract type required in order to generate an SQL sentence from said data retrieval and extraction condition inputted

from said retrieval condition generation means, Transmitting conditions and a display condition of this data retrieval and extraction condition are related with a hierarchical menu on said spreadsheet software which consists of 1 or two or more hierarchies. Registration and retrieval, extraction condition registration and conservation / edit means to save, It is characterized by providing retrieval and an extraction condition call means to call said retrieval / extract type related with said menu by which registration conservation was carried out with this retrieval, extraction condition registration and conservation / edit means, and said transmitting conditions and said display condition from said hierarchical menu.

[0010] It can carry out having the display condition input function of inputting the display condition which becomes from the file, the display position, and the means of displaying of said spreadsheet software which displays the data which extracts from said data base as the transmitting condition input function in which said data retrieval and extraction-condition input means carries out the assignment input of the data base on the server which searches and extracts data, and this server here, and the data retrieval condition input function which carry out the assignment input of the data retrieval conditions which extract data from this data base.

[0011] Moreover, suppose that it has an adjustable retrieval condition input function to make adjustable retrieval conditions that have an adjustable retrieval criteria specification function to specify that said data retrieval and extraction condition input means are adjustable in a part of data retrieval conditions, and said retrieval condition generation means was specified by this adjustable retrieval criteria specification function input.

[0012] Furthermore, said data retrieval and extraction condition input means can input two or more data retrieval conditions by said data retrieval condition input function, and a display condition for these two or more data retrieval conditions of every can be specified by said display condition input function, and suppose that said retrieval, extraction condition registration and conservation / edit means relates two or more of said data retrieval conditions and said display conditions with one menu collectively.

[0013] Furthermore, it is registration - by said retrieval, extraction condition registration and conservation / edit means. Suppose that data retrieval and an extraction condition reorganization collection means which changes and displays saved retrieval / extract type on the same means of displaying as said data retrieval and extraction condition input means, and carries out repeat edit of this retrieval / extract type are provided further.

[0014] Furthermore, said retrieval, extraction condition registration and conservation / edit means can presuppose that it has a hierarchical menu which performs a menu name of hierarchical menu group registration / conservation function to perform registration and conservation of 1 or two or more hierarchical menu groups, and a this hierarchical menu or this hierarchical menu group and menu group name modification, and modification, deletion and a duplicate of hierarchical relationship, and a hierarchical menu group edit function to said hierarchical menu.

[0015] Furthermore, a table name list display function on which said data retrieval and extraction condition input means display in a list a table name beforehand saved in a data base of said server, A train name list display function which displays in a list a train name beforehand registered into a table chosen when a list of these table names was chosen, Suppose that it has with a table name and a train name translation name display function which displays a translation name of a table name and a train name in a list with reference to a table and a train name translation name table beforehand saved in a data base of said server.

[0016] Furthermore, to 1 or two or more tables which have a train of a date and a time-of-day mold on inputted data retrieval conditions, said data retrieval and extraction condition input means can generate data retrieval conditions whose parts in connection with a data extraction period are adjustable, and can presuppose that it has an adjustable retrieval condition generation function to insert.

[0017] Furthermore, two or more tables with which said data retrieval and extraction condition input means have a train of a date and a time-of-day mold on inputted data retrieval conditions are received. One of each date and time-of-day type of two or more of these tables of the trains can be made into a joint train, and a class of a date and time-of-day mold of this joint train is distinguished, and data retrieval conditions which perform association between tables according to a class of joint train can be generated, and suppose that it has a connection condition generation function which inserts.

[0018] Furthermore, said data retrieval and extraction condition input means can presuppose that it has an infanticide condition input function to input conditions which extract only data of a fixed gap on inputted data retrieval conditions to 1, two or more constant time of day, or radix point time of day to 1 or two or more tables which have a train of a date and a time-of-day mold.

[0019] Invention of claim 11 searches and extracts data from a relational database on a server by computer. It is the record medium which recorded a control program for data base retrieval / extract which displays data on spreadsheet software on a client machine. This record medium makes data retrieval and an extraction condition for searching and extracting data from a database on a server input into a computer. Data is made to extract from a data base by which was made to transmit said SQL sentence which was made to generate an SQL sentence and was generated to a server by which the assignment input was carried out, and the assignment input was carried out from said inputted data retrieval and extraction condition. Sufficient retrieval / extract type required in order to generate an SQL sentence from said data retrieval and extraction condition which was made to change extracted this data into data format of said spreadsheet software according to a display condition by which the assignment input was carried out, was made to display it, and inputted it, Relate transmitting conditions and a display condition of this data retrieval and extraction condition with a hierarchical menu on said spreadsheet software which consists of 1 or two or more hierarchies, and registration and conservation of them are done. It is characterized by making said retrieval / extract type

related with said menu by which registration conservation was carried out, and said transmitting conditions and said display condition call from said hierarchical menu.

[0020]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to details with reference to a drawing.

[0021] Drawing 1 shows data base retrieval / extract structure of a system in 1 operation gestalt of this invention. As shown in drawing 1 , two or more client computers 100 and two or more server computers 200 can connect through a communication line (or system bus) 300. The spreadsheet software 110 is stored in the client computer 100.

[0022] In order that a client computer 100 may search and extract data from the data base 210 on the server computer 200 and may display data on the spreadsheet software 110 on a client computer 100 The data retrieval and the extraction condition input process 111 which inputs data retrieval and an extraction condition, The retrieval condition generation processing 112 which generates an SQL sentence from the inputted data retrieval and the extraction condition, The retrieval data extraction and the display processing 113 which displays the data which transmitted the generated SQL sentence to the server 200, and was extracted from the data base 210 of a server on the spreadsheet software 110 are executable. Furthermore, a client computer 100 relates above-mentioned data retrieval and extraction condition with the menu of spreadsheet software 110, can repeat the retrieval, extraction-condition registration and conservation / edit processing 114 which carries out registration conservation, and the retrieval and the extraction condition which were related with the menu by which registration conservation was carried out, and can carry out retrieval and extraction-condition call processing 115 of carrying out calling as it is possible, and the data retrieval and extraction-condition reorganization collection processing 116 of carrying out carrying out repeat edit in called its retrieval and extraction condition as it is possible.

[0023] Data retrieval and extraction condition input process 111 are realized by a transmitting condition input function, a data retrieval condition input function, and the display condition input function.

[0024] The above-mentioned transmitting condition input function is a server identifier and a log in user name, in order to connect with RDB (relational database)210 in the server (server computer) 200 in which desired data exists, A password is entered.

[0025] The above-mentioned data retrieval condition input function is equipped with the data ejection location appointed area, an owner name display list, a table name display list, a train name display list, the screen that sets up the train to take out, the screen which sets up the data list substitute to take out, the screen which sets up retrieval conditions, the screen which sets up a connection condition, the screen which sets up grouping, the screen which set up grouping conditions, the screen which check the SQL sentence generated, and a menu bar Furthermore, the data retrieval condition input function has a table name list display function, a train name list display function, a table name and a

train name translation name display function, the adjustable retrieval criteria specification function, the adjustable extract period retrieval condition generation function, the connection condition generation function, and the infanticide condition input function, and inputs data retrieval conditions.

[0026] For example, the basic operation which the basic operation which adds and inserts the train, the retrieval condition, and the connection condition which takes out data chooses with a mouse the input location appointed beforehand, and chooses a train name display list, can realize it by pushing the carbon button of an input, an addition, or insertion by the mouse or keyboard grabbing when keyboard entry is required, and deletes chooses with a mouse the input location appointed beforehand, and it can realize by pushing the carbon button of deletion by the mouse or keyboard grabbing.

[0027] The screen which sets up the train which the above takes out, the screen which sets up the data list substitute to take out, Each of the screen which sets up retrieval conditions, the screen which sets up a connection condition, the screen which sets up grouping, and the screen which sets up grouping conditions The SELECT phrase of [A] of the SQL sentence for an inquiry shown in drawing 2 , the ORDER BY phrase of [F], and WHERE of [C] It mainly corresponds to a phrase, the FROM phrase of [B], the GROUP BY phrase of [D], and the HAVING phrase of [E].

[0028] Moreover, when an owner name display list is chosen with a mouse, the selected owner owns the above-mentioned table name display list, and it displays a table name with an accessible user by the table name list display function. When a table name display list is chosen with a mouse, a train name display list is registered into the selected table, and displays a train name with an accessible user by the train name list display function.

[0029] Furthermore, the content displayed on a table name and a train name display list can be changed, and by the table name and the train name translation name display function, a table name translation name is displayed on a table name display list, and it displays a train name translation name on a train name display list. A table name and a train name translation name display function display a table name translation name on a table name display list with reference to the table name translation name table 211 which created to RDB210 of a server 200 beforehand, and was saved at it. If the table comment of the table chosen by the table name display list has registration of a train name translation name table, with reference to the train name translation name table which created to RDB210 of a server 200 beforehand, and was saved at it, a train name translation name will be displayed on a train name display list.

[0030] The above-mentioned adjustable retrieval criteria specification function carries out the assignment input of the retrieval conditions which can specify a part of retrieval conditions, when generating the SQL sentence which transmits to RDB210 of a server 200 with a retrieval condition generation means.

[0031] The above-mentioned adjustable extract period retrieval condition generation

function, a connection condition generation function, and an infanticide condition input function When the train of the date mold is defined as all the tables set up so that data might be searched and extracted When there are two or more tables with which the table which searches data searches data only in the case of one, assignment selection of this table is made. That selected table It considers as criteria Kursbuch and the train of the date mold uses further the train which was made to carry out the assignment input of this train only in the case of one when there were more than one, and was chosen as a criteria time-of-day train into this criteria Kursbuch.

[0032] An adjustable extract period retrieval condition generation function generates the retrieval conditions in which period assignment is possible to a criteria time-of-day train at the time of the SQL sentence generation by the retrieval condition generation processing 112. When there are other tables used in addition to criteria Kursbuch, a connection condition generation function The train from which only in the case of one it carried out the assignment input of the train when the train of the date mold had more than one, and it was chosen into the table It considers as the train to combine, the class of train to combine is investigated, and the class of criteria time-of-day train includes other classes of train to combine, or in being the same, the simple connection condition centering on a criteria time-of-day train is generated, and in being other, it generates discrete-value conditions. Here, the class of train expresses the unit of the change width of face of the data inputted into the train, for example, there are - part and a second at the time of year, moon, and day -, and the data of the change width of face of a year is included by the data of the change width of face of - part and a second at the time of moon and day.

[0033] An example of discrete-value data is shown in drawing 3 . An infanticide condition input function inputs the retrieval conditions which search and extract only the data of a fixed gap to the time of day or criteria time of day by which the assignment input was carried out. For example, they are the case where the data during per hour from 8:00 to 17:00 is extracted by one week, and the case where the data at 9:00 is extracted by one month.

[0034] The above-mentioned display condition input function carries out the selection input of the location which takes out data with a mouse, and expresses the information on a data ejection location in the data ejection location appointed area as a file name, sheet name, and a cel name.

[0035] When adjustable retrieval conditions are set as retrieval conditions by the adjustable retrieval criteria-specification function or the adjustable extract period retrieval condition generation function, by retrieval condition generation processing 112, generate an SQL sentence from the retrieval conditions which made input a retrieval condition value by the adjustable retrieval condition input function, and were inputted by data retrieval and extraction-condition input process 111, or the retrieval / extract type registered and saved by the retrieval and extraction-condition registration / conservation function.

[0036] In retrieval data extraction and display processing 113, this generated SQL sentence is transmitted to the data base of the server 200 specified on transmitting conditions, the data with which the SQL sentence was performed and extracted by the server 200 is received, and it changes into the data format of the spreadsheet software 110, and displays on the location specified by the display condition.

[0037] Retrieval, extraction condition registration and conservation / edit processing 114 consists of a retrieval and extraction condition registration / conservation function, and a hierarchical menu and a hierarchical menu group edit function. This retrieval and extraction condition registration / conservation function associates retrieval / extract type and the hierarchical menu which were generated from the transmitting condition, the retrieval condition, and the display condition inputted by data retrieval and the extraction condition input process 111, reconfigures a hierarchical menu, and saves it as a data base file for making regeneration of it possible. Retrieval / extract type is connected to the database of the server 200 specified on transmitting conditions here. The SQL sentence for the databases of a server 200 is generated from the false SQL sentence which has as a parameter the adjustable retrieval conditions generated from retrieval conditions. Transmit this generated SQL sentence to the database of a server 200, and the data with which the SQL sentence was performed and extracted by the server 200 is received. The data retrieval and the extract subroutine which changes this into the data format of the spreadsheet software 110, and displays this on the location specified by the display condition, In order to make possible the reorganization collection of the retrieval conditions inputted by data retrieval and the extraction condition input process 111 by data retrieval and the extraction condition input process 111, it consists of a retrieval condition reconstruction subroutine which reconfigures retrieval conditions.

[0038] Drawing 4 shows an example of the false SQL sentence which has as a parameter the adjustable retrieval conditions generated from retrieval conditions.

[0039] An above-mentioned hierarchical menu and an above-mentioned hierarchical menu group edit function perform modification of a hierarchical menu name or a hierarchical menu group name, and modification, deletion and the duplicate of hierarchical relationship.

[0040] Retrieval and the extraction condition call processing 115 are registration - by the above-mentioned retrieval and extraction condition registration / conservation function. The saved hierarchical menu is chosen and retrieval / extract type related with this selected menu is called.

[0041] Data retrieval and the extraction condition reorganization collection processing 116 are changed into retrieval conditions from retrieval / extract type called by retrieval and the extraction condition call processing 115, and it enables it to edit it by data retrieval and the extraction condition input process 111.

[0042] Next, with reference to the flow chart of drawing 5 and drawing 6 , the example of operation in the gestalt of 1 operation of this invention is explained.

[0043] The flow chart of drawing 5 shows the operations sequence about the data retrieval, the extraction condition input, registration, and conservation concerning this invention.

[0044] Before beginning the input of a data retrieval condition and a display condition, when investigating whether the client computer 100 concerned has connected to the data base 210 of the server 200 which searches data with step 501 first and having not connected with it, transmitting conditions, for example, the data base identifier of a server, a user name, and a password are entered by the above-mentioned transmitting condition input function at step 502, and the client computer 100 concerned is connected to the data base 210 of a server 200.

[0045] Next, in step 503, data retrieval conditions (from a user) are inputted by the above-mentioned data retrieval condition input function, and edit of a display condition is performed by the above-mentioned display condition input function of data retrieval and the extraction condition input process 111.

[0046] It investigates whether it has the train of the date mold in all the tables currently used on the inputted data retrieval conditions in the following step 504, two or more tables are used, and the joint relation of the table currently used on data retrieval conditions will be investigated, and if it has the train of the date mold in all the tables currently used, step 505 will be processed if joint relation is imperfect. At step 505, in setting up infanticide conditions, it thins out and inputs infanticide conditions (from a user) by the condition input function, adjustable retrieval conditions are set up to a criteria time-of-day train by the adjustable extract period condition generation function, and when two or more tables are used, a connection condition generation function generates a connection condition. In addition, the above-mentioned step 504 and the above-mentioned step 505 can be skipped when unnecessary.

[0047] Next, in step 506, when it investigates whether adjustable retrieval conditions are in the inputted data retrieval conditions and there are adjustable retrieval conditions, a retrieval condition value is inputted by the adjustable retrieval condition input function at step 507. Next, an SQL sentence is generated by the SQL sentence-generation function at step 508, the data extracted as a result of transmitting the SQL sentence generated by retrieval data extraction and display processing 113 at step 508 to the data base of the server specified on transmitting conditions and performing an SQL sentence at the following step 509 receives, it changes into the display format of the spreadsheet software 110, and the changed data displays on the location specified by the display condition.

[0048] At the following step 510, when two or more retrieval condition and display conditions are inputted (user), it investigates whether there are a retrieval condition and a

display condition which yet omits data retrieval and an extract, and when there is it, it returns to step 506.

[0049] Next, at step 511, the data displayed on the spreadsheet software 110 at step 509 is checked, and it investigates whether there is any correction of a retrieval condition and a display condition, and when there is the correction and return and correction are lost to step 503, it progresses to step 512.

[0050] At step 512, the hierarchical menu group and hierarchical menu which carry out registration conservation of retrieval and the extraction condition are inputted, and the file name which saves retrieval and an extraction condition is inputted. Next, at step 513, retrieval and extraction condition registration / conservation function generates retrieval / extract type, and registration conservation is carried out.

[0051] The flow chart of drawing 6 shows the operations sequence about the data retrieval and the extraction condition call concerning this invention.

[0052] First, the file which chose the hierarchical menu at step 601 and was registered by retrieval and extraction condition registration / conservation function at step 602 is opened. Data retrieval and an extract subroutine are started at the following step 603.

[0053] In the following step 604, it investigates whether the database 210 and the client computer 100 concerned of the server 200 specified by its data retrieval and extract subroutine have connected, and when having not connected, the client computer 100 concerned is connected to the data base 210 of a server 200 at step 605.

[0054] Next, if the false SQL sentence specified by data retrieval and the extract subroutine is analyzed, it investigates whether there are any adjustable retrieval conditions at the following step 607 and there are adjustable retrieval conditions at step 606, a retrieval condition value will be inputted by the adjustable retrieval condition input function at step 608.

[0055] Next, an SQL sentence is generated by the SQL sentence-generation function in step 609, and the SQL sentence generated by retrieval data extraction and display processing 113 at step 609 by step 610 is transmitted to the data base of the server specified on transmitting conditions, the data extracted as a result of performing an SQL sentence is received, it changes into the display format of spreadsheet software, and the data which changed displays on the location specified by the display condition.

[0056] At the following step 611, when two or more false SQL sentences are inputted, it investigates whether there is any false SQL sentence which yet omits data retrieval and an extract, and in a certain case, it returns to step 606.

[0057] (Gestalt of other operations) In addition, even if it applies this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, it cannot be overemphasized by the object of this

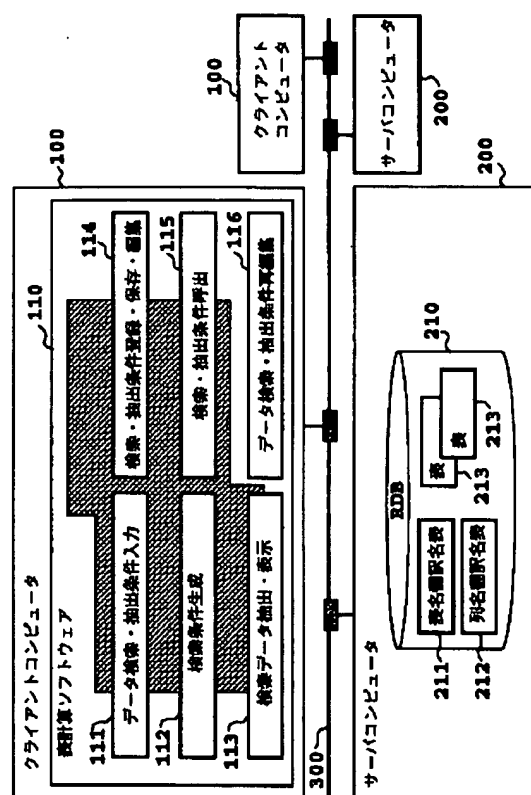
invention supplying the record medium which recorded the program code of the software which realizes the function of the gestalt of operation mentioned above to a system or equipment, and reading and performing the program code with which the computer of the system or equipment was stored in the record medium that it is attained. The record medium which recorded the program code will constitute this invention. For example, things are made, using the memory card of a floppy disk, a hard disk, and a non-volatile etc. as the record medium.

[0058]


[Effect of the Invention] As explained above, according to this invention, a user can input retrieval and an extraction condition according to the input screen corresponding to the SQL sentence for an inquiry. Furthermore, in searching and extracting data from a time-series-data table Since a user only chooses the train which wants to extract data and generates automatically the retrieval conditions and connection condition about a data extraction period, a user does not need to understand the syntax of an SQL sentence and can mitigate a user's burden as the result.

[0059] Moreover, the injury with relation of the menu of data retrieval and an extraction condition, and spreadsheet software which the user inputted according to this invention -- it can do easily and the effect which enables the repeat call from a menu is acquired.

Drawing selection [Representative drawing]



[Translation done.]

Drawing selection 

SELECT	[A]	FROM	[B]	WHERE	[C]
		GROUPBY	[D]	HAVING	[E]
		ORDERBY	[F]		

[Translation done.]

Drawing selection ☒

表A		
時間	A1	A2
97/10/30 08:00	10.0	5.2
97/10/30 09:00	11.5	4.5
97/10/30 10:00	13.2	7.9
97/10/30 11:00	14.0	8.2
97/10/30 12:00	13.5	6.9


表B	
時間	B1
97/10/30 07:29	0.7
97/10/30 09:10	1.5
97/10/30 09:21	1.2
97/10/30 09:45	1.0
97/10/30 11:00	1.9



表Aと表Bの単純な結合		
時間	A1	B1
97/10/30 08:00	10.0	
97/10/30 09:00	11.5	
97/10/30 10:00	13.2	
97/10/30 11:00	14.0	1.9
97/10/30 12:00	13.5	

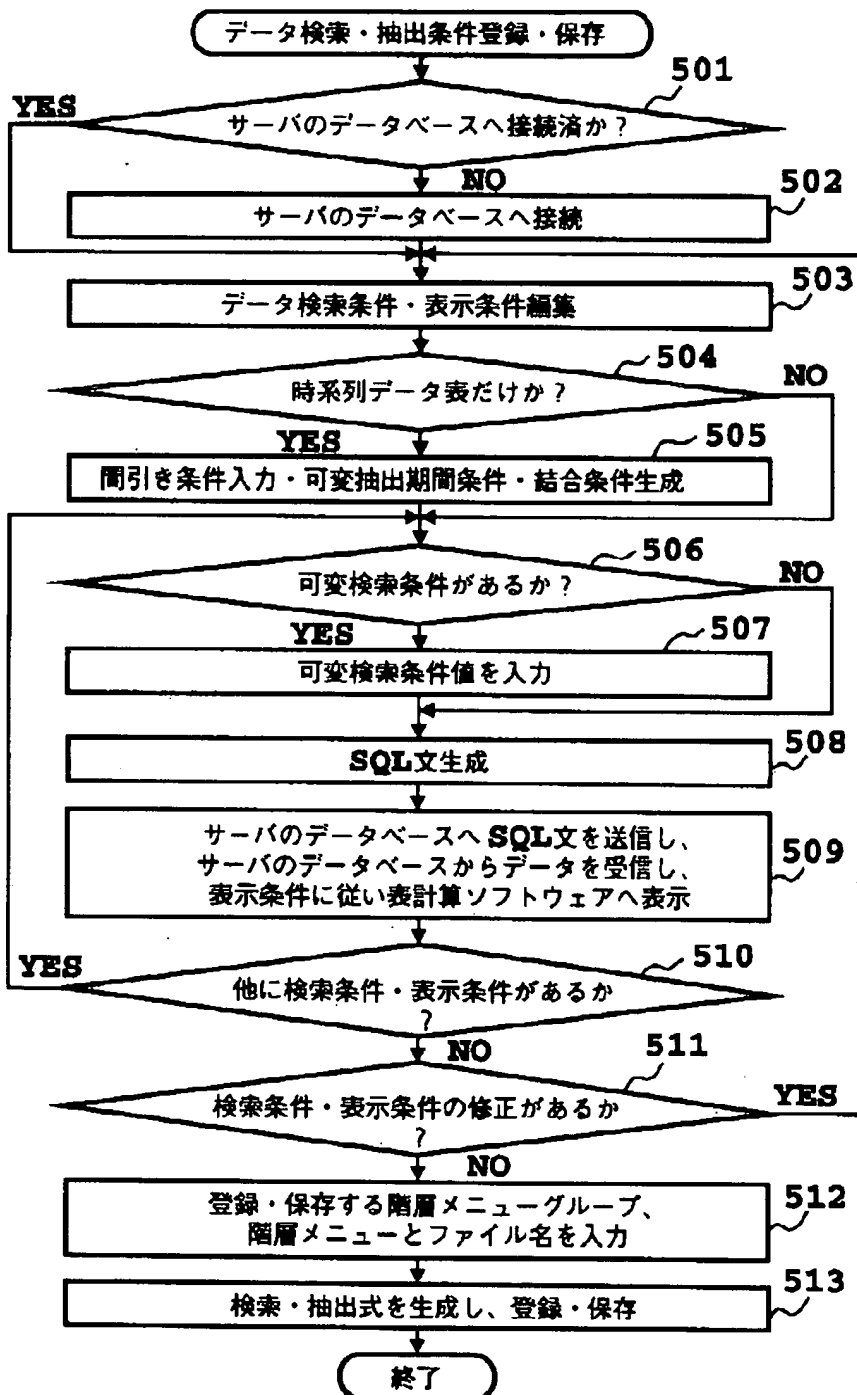

表Aと表Bの離散値結合		
時間	A1	B1
97/10/30 08:00	10.0	0.7
97/10/30 09:00	11.5	0.7
97/10/30 10:00	13.2	1.0
97/10/30 11:00	14.0	1.9
97/10/30 12:00	13.5	1.9

[Translation done.]

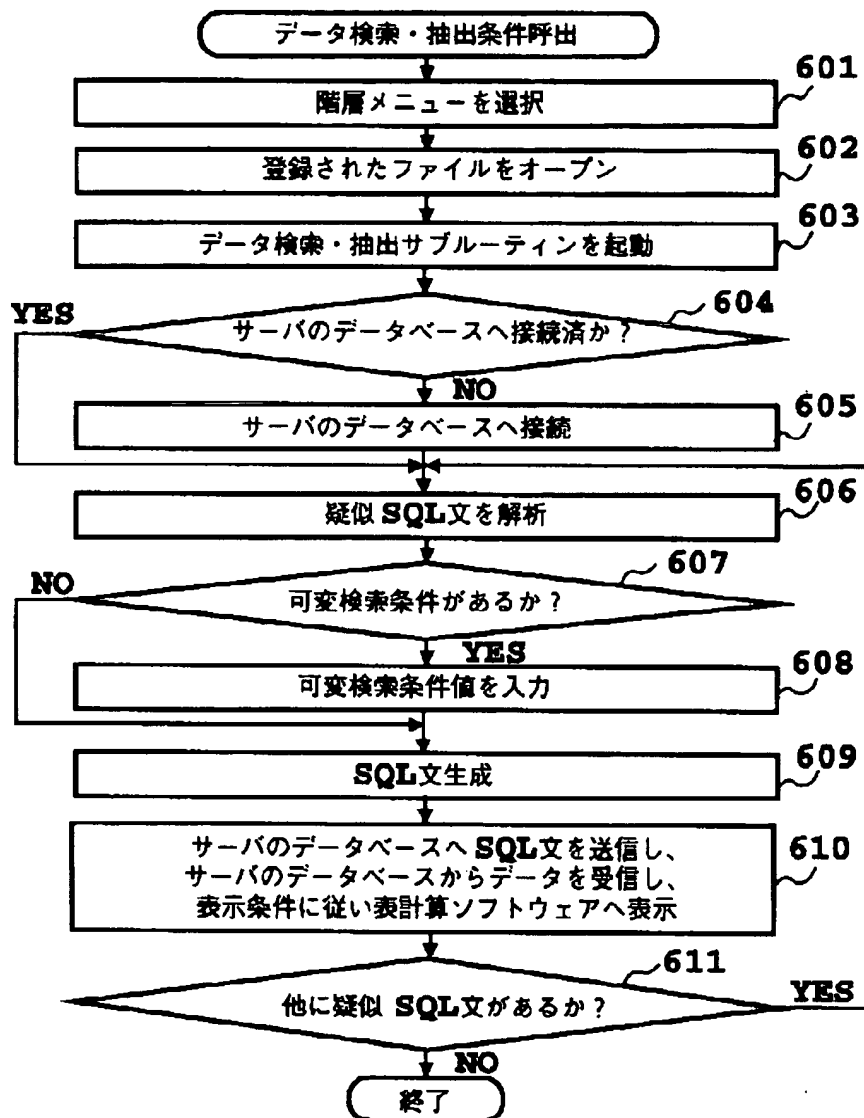
Drawing selection 

```
SELECT HIREDATE, EMPNO, ENAME FROM EMP
WHERE :D$SCOTT.EMP.HIREDATE,2,3,1,4: ORDER BY 1
```

[Translation done.]

Drawing selection 

[Translation done.]

Drawing selection ☒

[Translation done.]

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.